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Date: April 27, 1999

JOHNS MANVILLE INTERNATIONAL, INC.
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Case Docket No. [illegible]

THE COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

Re: Application of: Arterburn
Serial No.: 08/929,836 Art Unit No. 1731
Filed: September 15, 1997 Examiner: John Hoffmann
For: IMPROVED SCREEN FOR FIBERIZING BUSHINGS

Sir:

Transmitted herewith is/are the following document(s) relating to an appeal to the Board of Appeals in the above-identified application:

[ ] Notice of Appeal

[X] Appeal Brief

[ ] Reply Brief

[ ] Request for Oral Hearing

[ ] Please extend the time for filing the _____

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Notice of Appeal	$310.00	
Appeal Brief	$300.00	300.00
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1 month $110, 2 months $400, 3 months $950, 4 months $1,510		
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Arterburn Art Unit: 1731

Serial No. 08/929,836 Case Docket No. 6971

Filed: September 15, 1997 Examiner: John Hoffmann

For: **IMPROVED SCREEN FOR FIBERIZING BUSHINGS**

Commissioner of Patents and Trademarks
Washington, D. C.

Dear Sir:

In response to the Examiner's Final Office Action of December 15, 1999 and the Advisory Action of February 23, 1999, Applicants appeal from the final rejection of this application.

APPEAL BRIEF

Real Party in Interest

The real party in interest is Johns Manville International, Inc., previously Schuller International, Inc., assignee of the inventor, Arterburn.

Related Appeals and Interferences

None

Status of the Claims

Claims 1-24 remain in the application. Claims 1, 3, 5-7 and 16-20 stand allowed, claim 4 stands objected to and claims 2, 8-15 and 21-24 are under final rejection. Applicant appeals from the rejection of claims 8-10 under 35 USC 112, first and second paragraphs, claim 2 under 35 USC 102 (b), and claims 11-15 and 21-24 under 35 USC 103(a). A copy of the objected to and rejected claims 2, 4, 8-15 and 21-24 are provided in the Appendix attached to this Brief.

Status of Amendments

Following the Final Rejection, an amendment was filed. The Examiner issued an Advisory Action indicating this amendment would not be entered for a number of reasons including a conclusion that the amendment did not place the application in better form for appeal by materially reducing or simplifying the issues for appeal. Most of the amendments were in response to new grounds of rejection in the Final Office Action, and entering the amendment would appear to Applicant's attorney to have substantially simplified the issues for appeal.

Summary of the Invention

The invention is an improved bushing for making fibers from a molten material, such as glass, in a channel position (claims 2, 4, and 8-10), a lay-in precious metal screen for a bushing (claims 11-15) and a method of forming fibers from a molten material in a channel position of a multi-bushing fiberizing operation (claims 21-24).

Referring to Figure 1, in the manufacture of fibers such as glass fibers, a melt is formed in a large furnace 2 and the molten glass is transported in a refractory lined channel 4 to one or more legs 6, each leg having a plurality of spaced apart fiber forming bushing positions 10, 12, 14 and 16. Precious metal fiber forming bushings (Figures 2-5) are mounted below each leg 6 and each receives molten glass through a hole in the bottom of the refractory lining of the leg. The one or two bushing positions closest to the channel 4, i. e. positions 12 and 14, are called channel positions. For a number of reasons, often the molten glass is too hot when it enters the legs and into the bushings in the channel positions 12 and 14 and causes the channel bushings to break out excessively. A breakout occurs when one or more individual fibers break, usually near where the fiber is first formed. When one fiber breaks it starts a chain reaction of breaking fibers that very quickly can

break out the entire bushing. Each molten material has a fiberization temperature range within which the viscosity is such that fibers can be formed. If the temperature of the molten material is too high, the bushing breakouts per hour will be excessive, reducing productivity and material efficiency. The claimed invention addresses this problem and provides apparatus and a method that eliminates or greatly reduces this channel position problem. The lay-in screen invention also economizes on the use of very costly precious metal like platinum and rhodium used to make the fiberizing bushings.

The claimed fiberizing bushing for use in channel positions is illustrated in Figures 5 and 6 and is a modification of a conventional bushing which has at least one sidewall 26, a tip plate 22 having nozzles therein through which the molten glass flows to form fibers, and a screen 34 having a plurality of holes therein and mounted on the interior of the bushing spaced above the top of the tip plate 22. The purpose of the conventional screen in a bushing is to catch any refractory debris or unmelted material large enough to block one or more nozzles and to help homogenize the molten glass. The present improvement is to the screen as illustrated in Figures 6, 6A and 6B. By making the area of the holes per unit area of the screen in the center portion of the screen smaller than the area of holes per unit area of two end portions of the screen, one end portion being on either side of the center portion, and by making the end portion closest to the channel smaller in area than the other end portion, the bushing performs much better in a channel position than bushings having a conventional screen. A bushing containing this type of screen performs with a much lower break out rate (higher efficiency) in the channel positions than a conventional. The inventive screen has a risistance to flow in the center portion of the screen that is greater than the resistance to flow in the end portions of the screen.

The lay-in screen embodiment of claims 11-15 is illustrated in Figures 6, 6A and 6B and can be laid on top of a conventional screen

in a conventional bushing thus transforming the conventional bushing into a channel position bushing of the present invention and economizing on the number of spare precious metal bushings that an operation must inventory thus reducing the amount of precious metal in inventory. This precious metal, being platinum and rhodium, has a market value per pound exceeding that of gold with each bushing typically weighing more than ten pounds and a typical fiberizing plant having more than 100 fiberizing positions. The inventive lay-in screen 46 has a thickness in the range of 0.009-0.011 inch and a central portion 48 and two end portions 50 and 52, the area of the holes 60 per unit area of the central portion 48 being significantly less than the area of the holes 58 per unit area of the end portions, one of the end portions 50 being smaller than the other end portion.

The method of claims 21-22 is a method of forming fibers from a molten material in a channel position using the bushing described in claim 2. The method of claims 23-24 is similar, but uses a conventional bushing with the lay-in screen invention of claim 11 on top of the conventional screen in the bushing.

ISSUES:

1) Are claims 8, and 9 and 10 dependent therefrom, unsupported by the disclosure and thus improper under 35 USC 112,first paragraph, and indefinite under 35 USC 112, second paragraph, because of the term "open area"?

2) Is the invention of claim 2 anticipated by the teaching of Stalego 3,810,741?

3) Is the invention of claims 21 and 22 obvious in the sense of 35 USC 103 (a) in view of the teachings of Stalego?

4) Is the invention of claims 23 and 24 obvious in the sense of 35 USC 103 in view of the teachings of Marra 4,624,693?

5) Is the invention of claims 11-15 obvious in the sense of 35 USC 103 (a) in view of the teachings of Hill 4,330,312?

GROUPING OF THE CLAIMS:

1) Claims 2 and 4 stand or fall together.

2) Claims 8-10 stand or fall together since they are rejected only under 35 USC 112 and are not rejected on the basis of being anticipated or obvious to the ordinarily skilled artisan.

3) Claims 11-15 stand or fall together, and separately from claims 2 and 4, because they are drawn to a different solution to the channel position problem than the solution of claims 2 and 4.

4) Claims 21 and 22 stand or fall together as being a method of solving the channel position problem instead of the apparatus and because they are rejected for different reasons.

5) Claims 23 and 24 stand or fall together because they are rejected on a different basis than any of the above claims.

ARGUMENTS:

1. Claims 8-10 are supported by the disclosure and are not idefinite in the sense of 35 USC 112, first and second paragraphs, for the reasons stated by the Examiner.

Claims 8-10 stand rejected under 35 USC 112, first and second paragraphs, as containing subject matter not supported and not described adequately in the specification and for being indefinite, but this rejection or these rejections are believed to be erroneous for the reasons that follow. The target of the rejection seems to be the phrase "which open area in said end portions ranges between about 10 to about 16 percent open area based on the total area of

the end portions." Apparently the Examiner is objecting to the term "open area".

Applicant believes this term is defined clearly in the specification and therefore that these claims are supported by the specification and are definite, thus meeting both of the requirements of 35 USC 112, first and second paragraphs. Attention is directed to the specification at page 5, the penultimate line on the page where the holes in the screen are defined alternatively as "openings", to page 7, lines 6-9 where hole area and "open area" are used alternatively, and to page 13, last sentence in the paragraph in the middle of the page, where there seems to be literal basis for the "open area in said end portions ranges between about 10 to about 16 percent". Applicant believes that current claims 8-10 meet the requirements of 35 USC 112, first and second paragraphs, and respectfully requests the Board to reverse this rejection and allow the claims. However, Applicant is agreeable to amending claim 8 to change "open area" to "hole area" as was attempted in the Rule 1.116 Amendment, which was not entered, and to any other reasonable change that more particularly points out Applicant's invention.

2. Stalego 3,810,741 (Stalego) does not anticipate the invention of claim 2.

Claim 2 stands rejected under 35 USC 102 (b) as being anticipated by Stalego, but this rejection is believed to be erroneous for the reasons that follow. Stalego teaches a bushing for fiberizing molten glass having a heater strip (screen) with different hole sizes in different parts of the screen for the purpose of homogenizing the temperature and/or viscosity of the molten glass (col. 2, lines 25-35). Figure 4 of Stalego shows a screen having smaller diameter holes in the center portion of the screen than the diameter of the holes in the two end portions of the screen for the purpose of facilitating flow of colder glass at the ends of the bushing through the screen, see col. 6, lines 63-75 and col. 7, lines 1-35. This type of bushing screen appears to be the

same as the bushing screen reported in Applicant's specification at page 3, last two lines and page 4, the first three lines. This Stalego bushing, and particularly the screen, is different than the bushing claimed in present claim 2.

The bushing of claim 2 is for making fibers from a channel position and has a screen with a central portion and two end portions, one end portion being on either side of the central portion and one of the end portions being smaller in area than the other end portion with the smaller end portion being closest to the channel. The underlined limitations are not taught or suggested by Stalego and are critical to optimizing fiberizing efficiency in channel positions as reported in the specification at page 4, lines 1-4 of the second full paragraph.

The Examiner urges that a broad interpretation of claim 2 produces an embodiment that is anticipated by Stalego and that the limitations regarding "channel positions" and "closest to the channel" can be ignored because they are method of use limitations. Applicant disagrees with both of these assertions for the following reasons. The Examiner's broad interpretation example divides each end section of a Stalego screen into two equal portions and then moving right to left, the Examiner states, one would have a first (left) end portion, then a central portion, then a first (right) end portion, then a second (right) end portion. The Examiner does not explain how such a configuration, which Stalego doesn't seem to teache or suggest, anticipates the bushing and screen of present claim 2 which requires that one of the end portions is smaller in area than the other end portion. Nothing in Stalego teaches or suggests using a bushing having a different screen design for channel positions than is normally used in the remainder of the positions to improve fiberizing efficiency. Stalego neither teaches the structure claimed or the reason for the structure. While Stalego's invention might be intended, among other things, to address the problem with channel positions, Stalego does not teach, or remotely suggest, Applicant's claimed solution.

As to the limitations in claim 2 of "channel positions" and "closest to the channel", Applicant urges that these limitations are proper for the present invention and do limit the claimed bushing. Applicant urges that the bushing of claim 2 is novel, useful, and unobvious and therefore is proper subject matter for a patent claim. However, the bushing produces its novel usefulness when mounted in channel positions and then only when the bushing is oriented in a particular way, i. e. when the smaller of the two end portions is closest to the channel. For these reasons, Applicant urges that these limitations are meaningful, proper, and should be later read into the claims if they were not present by reading the claims in the light of the specification. These limitations should therefore should be given their full weight and meaning in present claim 2. When that is done, Stalego neither anticipates or suggests the bushing of claim 2 to the fiberizing bushing artisan. Applicant respectfully requests the Board to reverse this rejection and allow claim 2.

3. Claims 21 and 22 are not obvious in the sense of 35 USC 103 in view of the teachings of Stalego.

Claims 21-22 were rejected under 35 USC 103 as being unpatentable over Stalego, but this rejection is believed to be in error for the reasons which follow. Claim 21 is a method of forming fibers from a molten material in a channel position using a bushing having a screen with holes therein and with a center portion having a hole area per unit area of screen that is significantly less than the hole area per unit of screen area in two end portions of the screen, an end portion of the screen closest to said channel being smaller in area than the other end portion. While it is obvious to use the bushings taught by Stalego in any position, including channel positions of a fiberizing operation, doing so would not result in the claimed invention. The Examiner urges that one can arbitrarily define the regions of the Stalego screen so that there are two end portions - one of which is closer to the channel than the other. While that is true, such interpretation does not produce

the invention of claim 21, the use of a bushing with one end portion being smaller in area than the other end portion and the bushing being mounted such that the smaller end portion is closest to the channel.

4. Claims 23 and 24 are not unpatentable under 35 USC 103 (a) in view of the teachings of Marra 4,624,693 (Marra).

Claims 23 and 24 stand rejected under 35 USC 103 (a) as being unpatentable over the teachings of Marra, but this rejection is believed to be erroneous for the reasons that follow. The invention of claim 23 is a method of forming fibers from a molten material in a channel position with a bushing having at least one sidewall, a tip plate and a first screen spaced above the tip plate and having holes therein with the invention being the use of a second screen lying on top of the first screen, the second screen having a hole diameter and/or hole density in a central portion that is significantly less than the respective hole diameter and/or hole density in two end portions of the screen. The purpose of the second screen is to reduce the flow rate of molten glass therethrough and to reduce the flow rate more in the central portion of the screen than in the two end portions of the screen.

Marra teaches a bushing for fiberizing glass from molten glass. The bushing has a first plate (screen) 45 (Figures 2 and 3) having ports 51 and holes 48 therein and a movable second plate, also called a pressure regulator plate, (screen) 50, having apertures (holes) 46 therein, laying on top of the first plate 45. The purpose of the second plate 50 in Marra is set out in col. 1, lines 47-62, which is to be movable to restrict the flow of molten glass through the first plate 45 during normal running to maintain an effective head pressure on the discharge wall (tip plate) 37 low enough to create a "dripless bushing" and sufficiently movable upon bushing startups to cause the effective head pressure on the discharge wall (tip plate) 37 to increase above the "dripless"

pressure to cause the glass to "bead down", i. e. to drip from each orificed projection (tip or nozzle) 39 and pull a fiber behind which is necessary before a bushing can be started in the process of making continuous fiber products.

The Examiner urges that the top plate 50 of Marra has a central portion and two end portions (see Figure 2). The Examiner then urges that the hole density, holes per unit area of screen, is significantly less in the central portion than the hole density in the two end portions. Applicant disagrees with the Examiner's interpretation of what Marra teaches. Figures 2 and 3 of Marra, taken together since they are different views of the same bushing, clearly show the top plate 50 and that this plate has a central portion having openings 51 and end portions having no openings and thus the hole density of the central portion is much greater than the hole density of the end portions, and not significantly less as required by claim 23. The fact that the top plate 45 of Marra has no openings in the end portions excludes it from being read on the second screen of claim 23 since this claim states that the end portions of the second screen have a hole diameter and/or hole density.

It appears to Applicant that Marra reasonably teaches the skilled artisan that the diameters and pattern or density of his ports 51 in his top plate 45 match the diameter and pattern of the apertures in the bottom or first plate 45, note particularly Figure 3 and the statement in col. 3, lines 59-66 that the ports 51 in second plate 50 are adapted to be adjustably aligned. Unless the diameter and pattern of the ports 51 in plate 50 matched the diameter and pattern of the apertures in the plate 45, they could never be aligned. The fact that the holes are not shown throughout the central portion in Figure 2 doesn't mean that they are not there, only that it was the draftsman's license, i. e. not necessary to show all holes, etc. in a drawing when they are known to be merely repetitive.

The other interpretation described by the Examiner is either not understood or is improper since Marra does not reasonably teach a division of the top plate 50 such that there is an end portion with six holes or an end portion with one hole. Is it possible that the Examiner is looking at the other Marra patent, 4,612,027? In the first Office Action the Examiner rejected claims 16-18 and 20 using Marra 4,624,693 and also rejected claims 18-19 and 23-24 using Marra with no patent number indicated. Applicant assumed it was the Marra '693 reference since claim 4 of that reference is more compatible with what the Examiner said it meant than claim 4 of Marra 4,612,027. In the Final Office Action the Examiner did not indicate that he was switching the prior art relied on for the rejection to the other Marra patent, '027. However, the only screen in the bushing shown in Figure 2 of Marra '027, which is a vertical cross section of the bushing, is shown as having 6 large holes at the cut line in a center portion of the screen and three smaller diameter holes at the cut line in each of two end portions of the screen. However, Figure 4, which is a top view of this same screen shows a much higher number of holes and it is well established that the skilled artisan cannot rely on this type of drawing for the number of holes that Marra '027 actually teaches. Marra '027 does not teach or suggest a method in which a second screen of the type claimed in claim 23 is laid on top of a conventional first screen in a fiberizing bushing or that the lay-in screen that has a greater resistance to flow in the central portion of the screen than the resistance to flow through the two end portions of the screen, as is required by the last three lines of claim 23. The resistance to flow in the center portion of the only screen, or pressure control plate, shown in Figure 2 of Marra '027 is lower, not greater, than the resistance to flow of the two end portions, see col. 4, lines 5-34 and particularly lines 17-26. For this reason, in the event that the Examiner is relying on the teaching of Marra '027, it is believed that the Examiner's interpretation of this teaching is in error because Marra '027's screen has opposite resistance to flow characteristics than required by claims 23-24. One of the reasons for this is that the Marra '027 is not dealing with the channel

position problem that Applicant's invention solves, but rather is teaching a way of making a bushing that is not affected by one or more fibers breaking out in the peripheral region of the tip plate, i. e. a bushing that lives with individual fibers breaking out and minimizes their effect instead of trying to eliminate or greatly reduce the cause of the individual fibers breaking out.

Finally, the invention of claims 23 and 24 requires the use of a top screen having a central portion with a resistance to flow that is greater than the resistance to flow of the two end portions, not a lower resistance to flow than the end portions that the Examiner seems to describe. If the central portion had nine holes and the end portions had only six holes, all of the same diameter within the same area, the resistance to flow of the central portion would be less than the resistance to flow of the end portions and this is not what is defined in claims 23 and 24. Neither of the Marra patents either teaches or suggests a solution of the fiberizing difficulty with channel positions nor the bushing structure claimed by Applicant or the use of this bushing structure to solve the channel position problem as claimed in claims 23 and 24. For these reasons, the Board is respectfully requested to reverse this erroneous rejection and allow claims 23 and 24.

5. Claims 11-15 are not obvious in the sense of 35 USC 103 (a) in view of the teachings of Hall.

Claims 11-15 stand rejected under 35 USC 103 as being unpatentable over Hill, but this rejection is believed to be erroneous for the reasons that follow. Claim 11 defines a lay-in screen for laying on top of another screen in a fiberizing bushing, the lay-in screen having a central portion and two end portions, the central portion having a hole area per unit area that is significantly less than the hole area per unit area of the end portions, and one of the end portions being smaller than the other end portion. Claims 12-15 further define the term "significantly less". Note that claim 11 defines a lay-in screen having end

portions which have a hole area per unit area. Hill does not remotely teach or suggest such a lay-in screen structure.

The Examiner asserts that Figures 1 and 2 of Hill teach or suggest the claimed lay-in screen, but Figure 1 shows a multibushing fiberizing operation including a melting furnace 22, a forehearth 24 for transporting molten glass to positions 16, means or bushings 12 for fiberizing the molten glass into filaments 28 which are pulled and wound up on winding machines 38. Figure 2 illustrates a portion of the fiberizing means or bushing which is an orifice plate (similar to a tip plate of Figure 9) through which molten glass flows to form fibers, see col. 2, lines 36-41 and col. 4, lines 36-48. Figure 2 does not show a bushing screen or a lay-in screen - the orifice plate of Figure 2 is not for laying on top of another screen in a fiberizing bushing and nothing in the teachings of Hill teaches or suggests to the artisan to do so. The term "screen" as applied to an element of a melt fiberizing bushing is a recognized term of art, see the cited Russian patent 722,860, lines 3, 6, and 7 of the abstract and Veazie et al, col. 5, line 62 and therefore should be given the meaning that one of ordinary skill in the fiberizing bushing art would take it to mean. The Examiner urges that "the screen is deemed a lay-in screen because one can saw/cut it off and lay it over another screen." This assertion of the Examiner is erroneous, is unreasonable and has no basis. Where is the screen that the Examiner refers to and where is a suggestion or teaching that would lead the ordinary artisan to do this? Applicant does not understand the statement "The significantly less is 100%."

Hill does not teach or show a bushing screen or a lay-in screen. The closest that Hill comes to showing a screen in his fiberizing apparatus is the sheet 124 shown in Figure 7, but the sheet 124 is not a screen because it is welded to the orifice plate strips 54 becomming an integral part thereof, see col. 8, lines 25-31, i. e. sheet 124 is actually a part of the orifice plate of Hill's fiberizing bushing. The purpose of the sheet 124 is totally different than that of Applicant's lay in screen as shown by lines

14-21 of col. 8, i. e. to protect ceramic spacers 122 and prevent leakage. Note particularly lines 38-41 of col. 8 where it is taught by Hill to drill holes in the sheet 124 and the orifice plate strips 120 simultaneously --- so that flow of glass through the openings is not inhibited. Note also that nowhere does Hill suggest laying another screen on top of sheet 124 nor of laying sheet 124 on top of another screen. The sheet 124 is of course totally different than Applicant's claimed lay-in screen because it doesn't have variation of hole areas per unit area of screen in different portions of the screen. Thus, Hill actually leads the skilled artisan away from this novel and critical feature of the claimed invention, that of having different hole diameters and/or hole densities in different portions of the screen. The refractory block sections 56 pr 122, or the portions of sheet 124 covering blocks 56 or 122, do not have holes and therefore do not have hole diameters or hole densities and thus cannot reasonably and correctly be given the interpretation urged by the Examiner.

For these reasons Applicant believes that claims 11-15 are patentably distinct from the teachings of Hill and respectfully requests the Board to reverse this rejection and allow claims 11-15.

Respectfully submitted,

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APPENDIX

List of Rejected Claims

2. In a bushing for making fibers from a molten material from channel positions, said bushing comprising at least one sidewall and a tip plate or orifice plate through which molten material flows to form the fibers, and a screen having a plurality of holes therethrough and mounted on the interior of the bushing and spaced above the top of the tip plate or orifice plate, said screen having holes therein and being attached to said sidewall, the improvement comprises a generally mid or central portion of the screen having a hole area per unit area of screen that is significantly smaller than the hole area per unit area of screen of two end portions of the screen, one end portion being on either side of the mid or central portion, one of said end portions being smaller in area than the other of said end portions with the smaller end portion being closest to the channel.

4. (Objected to) The bushing of claim 2 wherein said material is glass and said bushing, including the screen, is made from a precious metal or precious metal alloy with the major portion of said metal being platinum and wherein said screen has a thickness of between about 0.009 to about 0.015 inch.

8. The bushing of claim 2 wherein the hole area per unit area of screen in said central portion is at least 10 percent less than the hole area per unit area of said end portions, which open area in said end portions ranges between about 10 to about 16 percent open area based on the total area of the end portions.

9. The bushing of claim 8 wherein the hole area per unit area of screen in said central portion is at least 20 percent less than the hole area per unit area of said end portions.

10. The bushing of claim 9 wherein the hole area per unit area of screen in said central portion is at least 30 percent less than the hole area per unit area of said end portions.

11. A lay in screen of a precious metal or precious metal alloy for laying on top of another screen in a fiberizing bushing having a plurality of holes therethrough, said lay in screen comprised of a mid or central portion and two end portions, said mid or central portion having a hole area per unit area of the central portion that is significantly less than the hole area of the end portions per unit area of the end portions, one of the end portions being smaller than the other end portion, and the thickness of said screen being between about 0.009 and 0.011 inch.

12. The screen of claim 11 wherein said significantly less is at least 10 percent.

13. The screen of claim 12 wherein said significantly less is at least 20 percent.

14. The screen of claim 13 wherein said significantly less is at least 25 percent.

15. The screen of claim 14 wherein said significantly less is at least 30 percent.

21. A method for forming fibers from a molten material in a channel position of a multi-bushing fiberizing operation comprising at least one sidewall and a tip plate or orifice plate through which the molten material flows to form the fibers, and a screen spaced above said tip plate having a plurality of holes therein, said screen being attached to said sidewall, the improvement comprising a bushing screen in said bushing having a hole area per unit of screen area in a center portion of the screen that is significantly less than the hole area per unit of screen area in two end portions of

the screen, an end portion of the screen closest to said channel being smaller in area than the other end portion.

22. The method of claim 21 wherein the hole area per unit of screen area in the central portion of the screen is less than at least about 30 percent of the hole area per unit of screen area in said at least one end portion of said screen.

23. In a method for forming fibers from a molten material in a channel position of a multi-bushing fiberizing operation comprising at least one sidewall and a tip plate or orifice plate through which the molten material flows to form the fibers, and a first screen spaced above said tip plate and having a plurality of holes therein, the first screen being attached to said sidewall, the improvement comprising using a second screen lying on top of the first screen, said second screen having a hole diameter and/or hole density in a central portion of the screen that is significantly less than the respective hole diameter and/or hole density in two end portions of the screen such that resistance to flow of molten glass through the central portion of the second screen is greater than the resistance to flow through the two end portions of the second screen.

24. The method of claim 23 wherein the hole size and/or hole density of said central portion of said second screen is such that the percentage of hole area in said central portion is at least about 10 percent less than hole area percent of the end portions.